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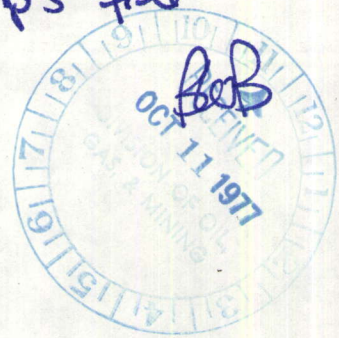

NEGATIVE DECLARATION

REGARDING ISSUANCE OF A LICENSE TO

WYOMING MINERAL CORPORATION

URANIUM RECOVERY FACILITY

SALT LAKE COUNTY, UTAH

DOCKET NO. 40-8585

The U. S. Nuclear Regulatory Commission (the Commission) has issued a source material license for the operation of a natural uranium recovery facility by the Wyoming Mineral Corporation at the Kennecott Copper Corporation's Bingham Canyon Mine near Copperton, Utah.

The Commission's Division of Fuel Cycle and Material Safety has prepared an environmental/safety impact appraisal for the operation of the Uranium Recovery Facility. On the basis of this appraisal, the Commission concluded that an environmental impact statement for this particular action is not warranted because there will be no significant environmental impact attributable to the action. The environmental/safety impact appraisal is available for public inspection and copying at the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555.

Dated at Silver Spring, Maryland, this 15th day of September, 1977.

FOR THE NUCLEAR REGULATORY COMMISSION

Leland C. Rouse

Leland C. Rouse, Chief
Fuel Processing & Fabrication Branch
Division of Fuel Cycle & Material Safety

UNITED STATES NUCLEAR REGULATORY COMMISSION

ENVIRONMENTAL/SAFETY IMPACT APPRAISAL

BY THE

DIVISION OF FUEL CYCLE AND MATERIAL SAFETY

IN CONSIDERATION OF THE ISSUANCE OF A

SOURCE MATERIAL LICENSE FOR

URANIUM RECOVERY FROM COPPER DUMP LEACH SOLUTION FACILITY

SALT LAKE COUNTY, UTAH

FOR

WYOMING MINERAL CORPORATION

DOCKET NO. 40-8585

DATED: September 15, 1977

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1. Description of Proposed Action

1.1 Proposed Action

By letter dated November 2, 1976, Wyoming Mineral Corporation (WMC) requested a license to receive, possess, use and transfer source material in the course of extracting uranium from copper leach solutions at the Kennecott Copper Corporation's (KCC) Bingham Canyon Mine near Copperton, Utah.

The purpose of this proposal is to provide added production capability to help meet the U_3O_8 requirements in the U.S. for nuclear power plant operations. This impact appraisal discusses the environmental and safety aspects of the proposed application. The proposed action is to grant a license to the Wyoming Mineral Corporation.

1.2 Background Information

Kennecott Copper Corporation, the largest copper producer in the U.S., operates four copper mines in four western states - including the largest open-pit mine in the world - The Bingham Canyon Mine located near Salt Lake City, Utah.

1.2.1 Mining

The mining method employed in this open-pit is typical of the techniques used to mine large, low-grade ore deposits at or near the surface.*

The minable material consists of vast masses of low-grade ore containing about 0.8 percent copper. Often the ore zones are overlain or flanked by waste rock containing little or no metal content. Thus, the mining of the economic material becomes a dual operation involving both the disposal of waste rock and the recovery of the copper ore beneath or adjacent to it. The pits are dug in the form of amphitheaters, with various levels, or steps, cut in the sides. These steps, or benches, are the working places for the huge electric shovels that eat into the walls of the pit, from which the ore and waste rock are first loosened by blasting. These benches also serve as haulageways for the transportation of both ore and waste. The ore is delivered to the crushing plant and to the mill by train or truck, and waste is transported to the waste dumps by similar means.

* References are listed in Section 10

1.2.2 Processing

1.2.2.1 Concentrating

A concentrating plant is located as close as practicable to the mine. Here large chunks of ore are crushed and ground to reduce the ore to a minute size. The pulverized ore mixed in water as a slurry then goes through the flotation section of the mill, where chemical reagents are added to cause the copper mineral particles with some of the waste interlocked, to rise to the top of a flotation cell and overflow as copper concentrate containing 15 to 35 percent copper. To prepare concentrate for smelting, most of the water is removed in thickening tanks and by filtration. This cycle is repeated to recover other valuable minerals. The remaining waste, or tailings, are disposed of in the dumps.

1.2.2.2 Leaching

In addition to ore sent to the mill, millions of tons of waste rock, containing too little copper to justify conventional milling, are sent to dumps. Copper is recovered from this waste by leaching. Water, pumped to the tops of the dumps, percolates downward, leaching the soluble mineral. These copper-bearing solutions are sent to a precipitation plant, where precipitation cones strip the metal from the solutions. This material is in the form of precipitate copper, or cement copper, and contains 83 to 90 percent copper. The new precipitation plant near the Bingham Canyon mine recovers 6,000 tons of copper monthly from copper-bearing solutions from the waste dumps.

The recovered concentrates and precipitates are subjected to smelting and refining operations to produce the pure copper products.

1.2.2.3 Copper By-Products

Valuable by-products are produced in the course of Kennecott's processing operations.

Molybdenum, contained in the ores, is recovered as molybdenite in the concentrating mills. Rhenium is recovered as an added by-product.

The sulfur dioxide gas generated in the smelting process is converted to sulfuric acid and either used in Kennecott's operations or sold.

Gold, silver, platinum, and palladium, along with selenium, tellurium, and nickel sulfate, are recovered from the mud or solution of the refining tanks. While present in the ores only in small quantities, the huge tonnage of ore handled permits significant amounts of some of these elements to be recovered. As a result, Kennecott is the second largest U.S. gold and molybdenum producer and one of the leading producers of silver.[2]

1.2.2.4 By-Product Uranium Recovery

In the U.S. over 200,000 tons of copper per year are being produced by leaching waste rock and oxidized copper ore with dilute sulfuric acid-ferric sulfate solutions and precipitating the copper on scrap iron. The flow of solutions is in excess of 80 million gallons per day. A survey conducted by the U.S. Bureau of Mines in late 1965 at 14 mines in Arizona, Utah, and Nevada, showed that with a few exceptions, the solutions contain from two to a maximum of 15 ppm U_3O_8 with strong evidence that these represented equilibrium concentrations and not merely an accumulated in-process inventory resulting from recycling the solutions from many years. Consequently, it was believed that uranium could be recovered at a constant rate as long as mining and leaching operations continued. Bureau of Mines' (USBM) surveys and estimates indicated a production potential of possibly 1000 tons of U_3O_8 per year if the major process streams from most of the large copper mines in the western U.S. were to be treated by a combination of ion exchange resin and/or solvent extraction techniques to recover their uranium contents.

A joint pilot plant investigation by Kennecott Copper Corporation and the USBM was conducted with solutions from the Bingham Canyon mine to evaluate a new system of countercurrent ion exchange developed during USBM laboratory studies.[3] The pilot plant test was conducted for a six week period on a three shift per day, five day per week basis using the effluent from the old copper cementation launders at the plant as feed solution. A metallurgical balance for the entire test period

showed a recovery of 79.6%. The calculated uranium recovery based on feed and tailing assays was 80.5%. Recovery of the uranium from the pregnant resin eluates by solvent extraction (the "Eluex Process") followed by continuous precipitation by neutralization with ammonia resulted in a product which after calcination at 675° C for two hours, assayed 98.4% U_3O_8 and met all specifications established for sale either to the AEC or to the nuclear power industry.

Wyoming Mineral Corporation proposes to construct and operate a uranium extraction facility applying the above at the Kennecott Copper Corporation's Bingham Canyon mine near Copperton, Utah.

1.3 Bases for Staff Appraisal

An impact assessment for the licensing action on the Copperton facility, located on the Kennecott Copper Corporation Bingham Canyon mine property, in Salt Lake County, Utah, has been performed by the Division of Fuel Cycle and Material Safety (FCMS or the staff) of the Nuclear Regulatory Commission (NRC or Commission).

The staff independently prepared the appraisal on environmental and safety considerations associated with the proposed license in accordance with 10 CFR Part 40, Licensing of Source Material and 10 CFR Part 51, implementing the requirements of the National Environmental Policy Act of 1969 (NEPA) and the President's Council on Environmental Quality (CEQ) guidelines.[4,5]

In conducting this appraisal, the staff has considered the following items:

- Environmental information and supplements submitted by the applicant to support the application for a license.
- Information regarding the facility, location, site and auxiliary facilities from the Kennecott Copper Corporation.
- Information supplied by the Salt Lake County Planning Commission and other agencies.
- Site visit by NRC staff on June 7, 1977.

In performing the assessment for the proposed action, which included a review of the above noted information, the staff concluded that the appraisal should include:

- Site Location and Land Use
- Demography
- Meteorology
- Hydrology
- Geology
- Seismology
- Control of Effluents
- Environmental Monitoring
- Environmental Impact of Plant Operation
- Plant Safety
- Accident Potential

2. Description of the Site Environment

2.1 Site Location and Land Use

The proposed Copperton site occupies 1.3 acres of Kennecott Copper Corporation's Bingham Canyon mine property located approximately thirty (30) miles southwest of Salt Lake City. The site is on the eastern slope of the Oquirrh Mountain Range in what is known as the Bingham or West Mining District. The 1.3 acre site will be under lease to WMC. It is currently vacant and zoned for heavy industrial use by Salt Lake County.[6,7,8]

The proposed plant will occupy less than 0.2 acre of the site with the remainder allocated to parking, loading and storage areas or boundary space. No other uses are proposed for the property.

2.2 Demography

Salt Lake Valley is on the eastern edge of the arid Basin and Range Region of the western U.S. It is defined by the Oquirrh and Wasatch Mountains and has an area of approximately 375 square miles. The Jordan River bisects the Valley, carrying the flow of the mountain streams to Great Salt Lake.

The population of Salt Lake Valley increased from 383,000 in 1960 to 522,000 in 1970 and by 1985 it is expected to be 789,000. Of the 406,000 increase, approximately 53,000 is expected in Salt Lake City and 353,000 in the rest of the Valley.

Salt Lake County is composed of three general land types: the mountains, the northwest marsh and desert area; and the Valley floor.

The Valley floor contains the highly urbanized area including Salt Lake City and the predominantly agricultural area in the southeast and the southwest. The latter are proposed to remain primarily rural by the Planning Commission.

There are three unincorporated towns within a five mile radius of the proposed site. Nearly all of the population is located in the sparsely populated Bingham Canyon Census Tract of Salt Lake County as listed in Table 2-1 and shown in Figure 1. The site vicinity, zoned for heavy industry, experienced a population decrease - in contrast to the expected increase in population for the expanded 50-mile area, as Kennecott Copper Corporation's 1800-acre Bingham Mine operation expanded into the City of Bingham Canyon during the last decade. No land use changes are anticipated in the environs of the facility which is undeveloped and is basically uninhabited mountain land to the west, north and south. Directly to the east, is the agricultural land of the Jordan River Valley. The area's largest employer is Kennecott Copper Corporation's Bingham Canyon Mine with approximately 2,700 employees who commute mostly from outside the vicinity of the mine site.

The facility site is within approximately 400 feet of the copper cementation plant on the KCC property as shown in Figure 2.

TABLE 2-1

TOWNS AND SETTLEMENTS WITHIN 5-MILE
RADIUS OF COPPERTON PLANT SITE (a)

Town (b)	General Direction from Site	Distance from site (miles)
Copperton	E	0.5
Lark	S, SW	3.0
Herriman	SE	5.0
Remainder	SSW, SE	4.0-5.0

(a) Based on Census Tract 131, 1976 estimate
(b) All towns are unincorporated

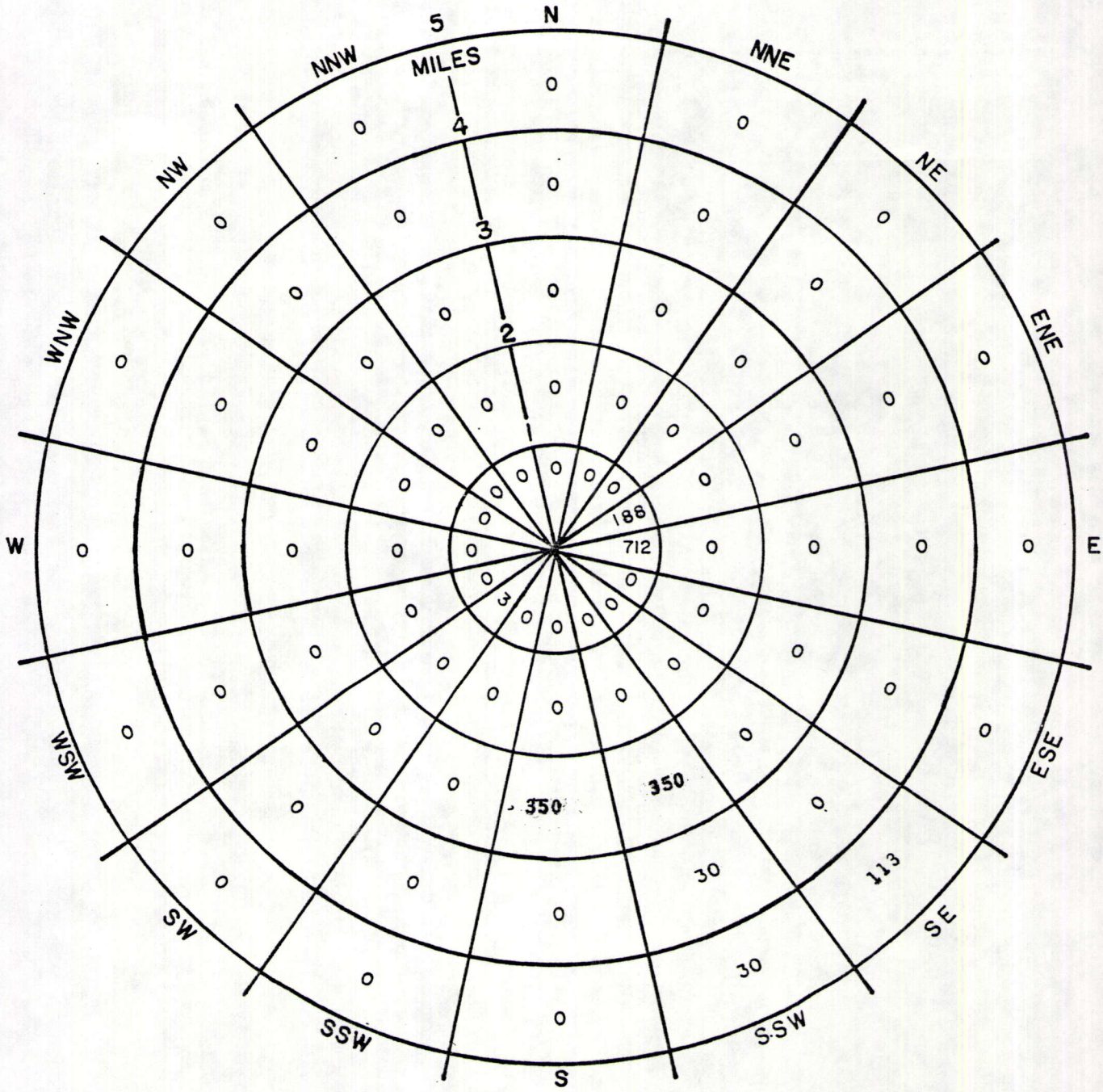


FIGURE 1:
POPULATION DISTRIBUTION WITHIN 5 MILES OF COPPERTON

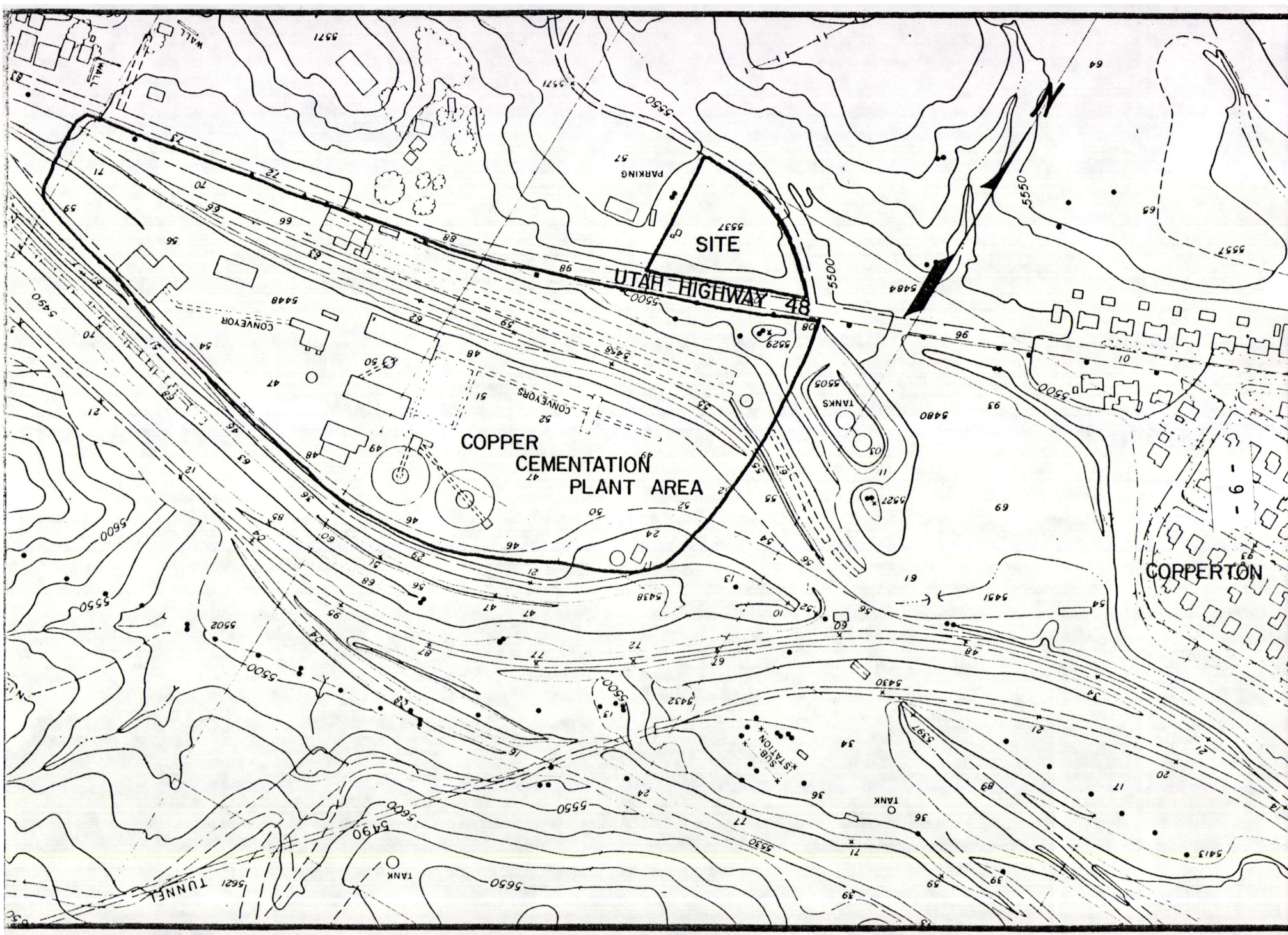


FIGURE 2: DETAILED SITE MAP (JUNE, 1977)

2.3 Meteorology

The weather and climate conditions of the Bingham Canyon area can be related to the National Weather Station measurements at Salt Lake City, northeast of the site, and to a cooperative station 4 miles southeast of the site area.[10] The region has a cold, dry (semiarid) climate. Normal annual precipitation varies between 15 and 20 inches. Normal precipitation in the wettest month (April) is 2.2 inches. Average length of the wet season is two (2) to four (4) months with a possible deviation of 20 to 25 percent in the precipitation occurrence. Snowfall, normally about thirty percent of the annual precipitation in the area, starts about the end of October. This equates to between 50 to 60 inches of snow with the ground covered with one inch of snow for at least 60 to 70 days annually.[11]

Yearly mean temperature for the area is 49.8° F. January is the coldest month and July is the hottest. In January the daily average temperature is about 20° F ranging between a minimum of 17° F and a maximum of 97° F for Salt Lake City. Temperatures in the Bingham Canyon area can be expected to be lower because of its higher altitude. The average temperature for July is about 85° F, varying between 59 and 94° F on a daily basis.

The pressure systems, in combination with the local topography, cause the prevailing winds to be from the southeast for Salt Lake City and from the southwest for Bingham Canyon. The Oquirrh Mountains modify the regional southwesterly wind flow direction for Salt Lake City. Partial wind data from Copperton, Utah, show an even division between southeast and southwest components, with a strong contribution from the west-northwest. The Bingham Canyon site is within a region that is favorable for dispersion minimizing the potential for affecting inversion situations.

2.4 Hydrology

2.4.1 Surface Water

Surface drainage at the site is southeast toward Bingham Creek. Bingham Creek is a part of the Kennecott Copper Corporation's copper leach circuit. It has an average annual flow rate of approximately 3470 gpm. It receives its water from the copper leach dumps (approximately 33% of its watershed is covered by dumps), from runoff and from springs upstream in the Oquirrh Mountains. It flows eastward into a reservoir about one-half mile southeast of Copperton. This reservoir has no outlet. Water from the reservoir is pumped up to the copper leach dumps.[12] A water sample taken from Bingham Creek in the spring of 1976 had a pH of 3 and a total dissolved solids (TDS) content of 56,000 ppm. These values are to be expected since all of the perennial tributaries of Bingham Creek originate in the mine dump areas.

2.4.2 Ground Water

Extrapolating from holes drilled at the copper cementation plant, it is estimated that the groundwater is found at a depth of 125 feet beneath the site.[13]

The dominant direction of groundwater flow is southeast toward Bingham Creek. The nearest groundwater user is the Town of Copperton (see Figure 2) which obtains its water from two wells drilled to a depth of 1200 feet. All KCC facilities near the Copperton plant are supplied by a potable water system that obtains its water from the Oquirrh Mountains and from deep wells. None of the water for either of these systems is obtained locally.[14]

2.5 Geology

The site is located on the east side of the Oquirrh Mountains which are part of the Basin and Range physiographic province. The province is characterized by long, narrow, isolated, nearly-parallel mountain ranges separated by elongate basins filled with unconsolidated sediments.[15] The Oquirrh Mountains are a north-south trending mountain range that has been strongly folded and pushed upward as part of a thrust sheet that has moved eastward.

Surficial material at the site consists of poorly sorted, poorly consolidated alluvial material (Harpers Fanglomerate Formation). This formation is 202 feet thick according to site well log data. Beneath this formation is igneous bed rock of unknown thickness that dips eastward from the Oquirrh Mountains.[16]

The soil at the site is extremely stony loam formed from andesite rocks on alluvial fans to a depth of 20 to 40 inches. It is well drained, has a moderately slow permeability and exhibits rapid runoff.[17]

2.6 Seismology

Earthquakes in Salt Lake County are dominantly associated with the Wasatch Front, a part of the Intermountain Seismic Belt.[18] This belt stretches from the Gulf of California through western Arizona, central Utah, southeastern Idaho, western Montana and into British Columbia.

Earthquakes along the Wasatch Front in Utah and in Salt Lake County, Utah, have been recorded since the mid-nineteenth century. The rate of earthquake occurrence in the Intermountain Seismic Belt is plotted in Figure 3. Epicenters for earthquakes along the Wasatch Front in Utah are plotted in Figure 4 and are summarized in Table 2.2. From this table, it can be concluded, that in a 21-year period, an earthquake of magnitude -6 can be expected, and in a 5-year period, an earthquake of magnitude -5 could occur for the Wasatch Front.[19]

The plant will be designed to withstand a magnitude -6 earthquake which is in compliance with local building codes.

3. The Facility

3.1 Facility Structures

WMC will construct a uranium extraction plant and ancillary structures on a 1.3 acre plot leased from Kennecott Copper Corporation. The plant will recover uranium from KCC's dump leach solution after its contained copper is recovered by precipitation (cementation).

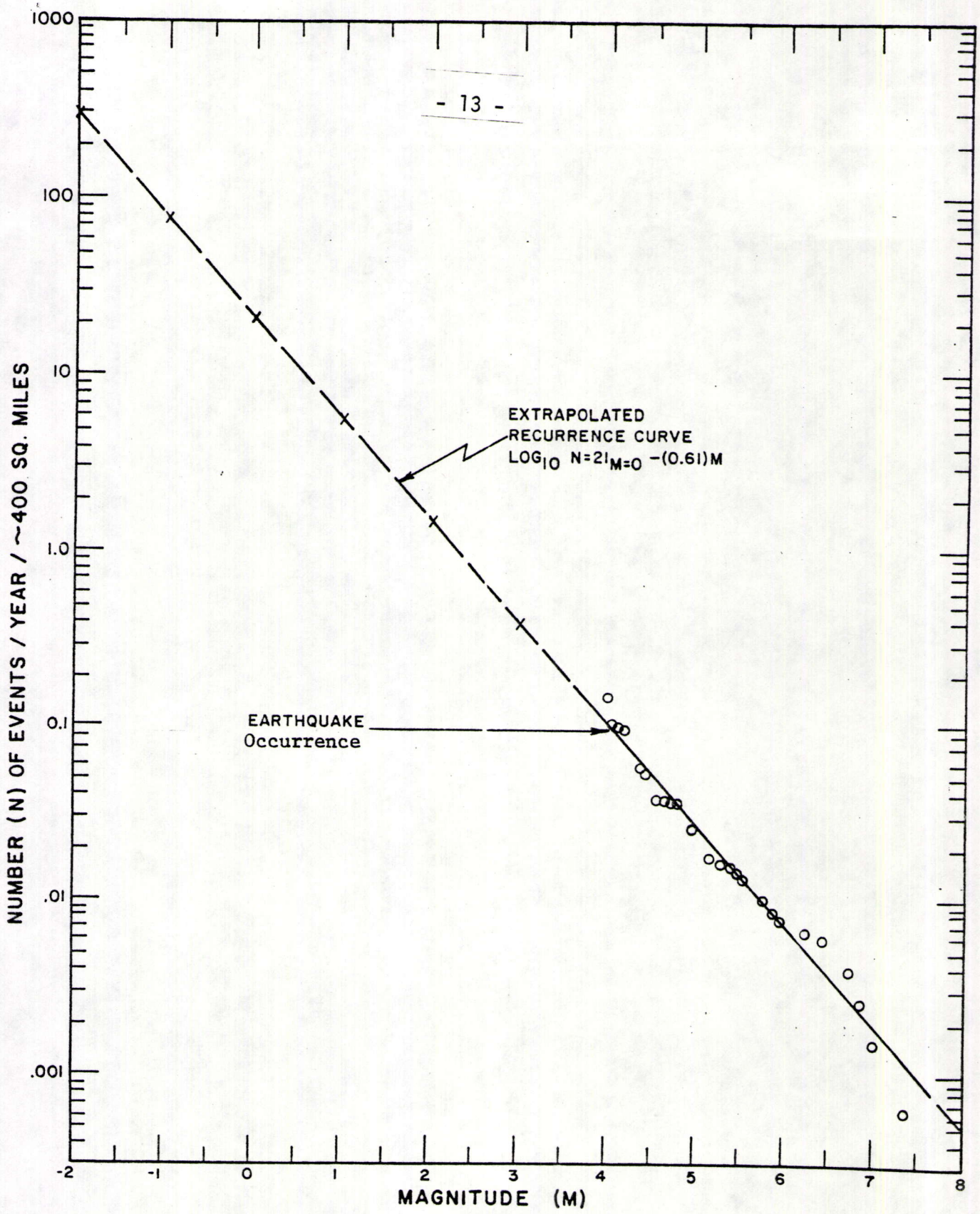


FIGURE 3 CURVE SHOWING EARTHQUAKE OCCURENCES AND EXTRAPOLATED EARTHQUAKE RECURRENCE RATE IN THE INTERMOUNTAIN SEISMIC BELT.

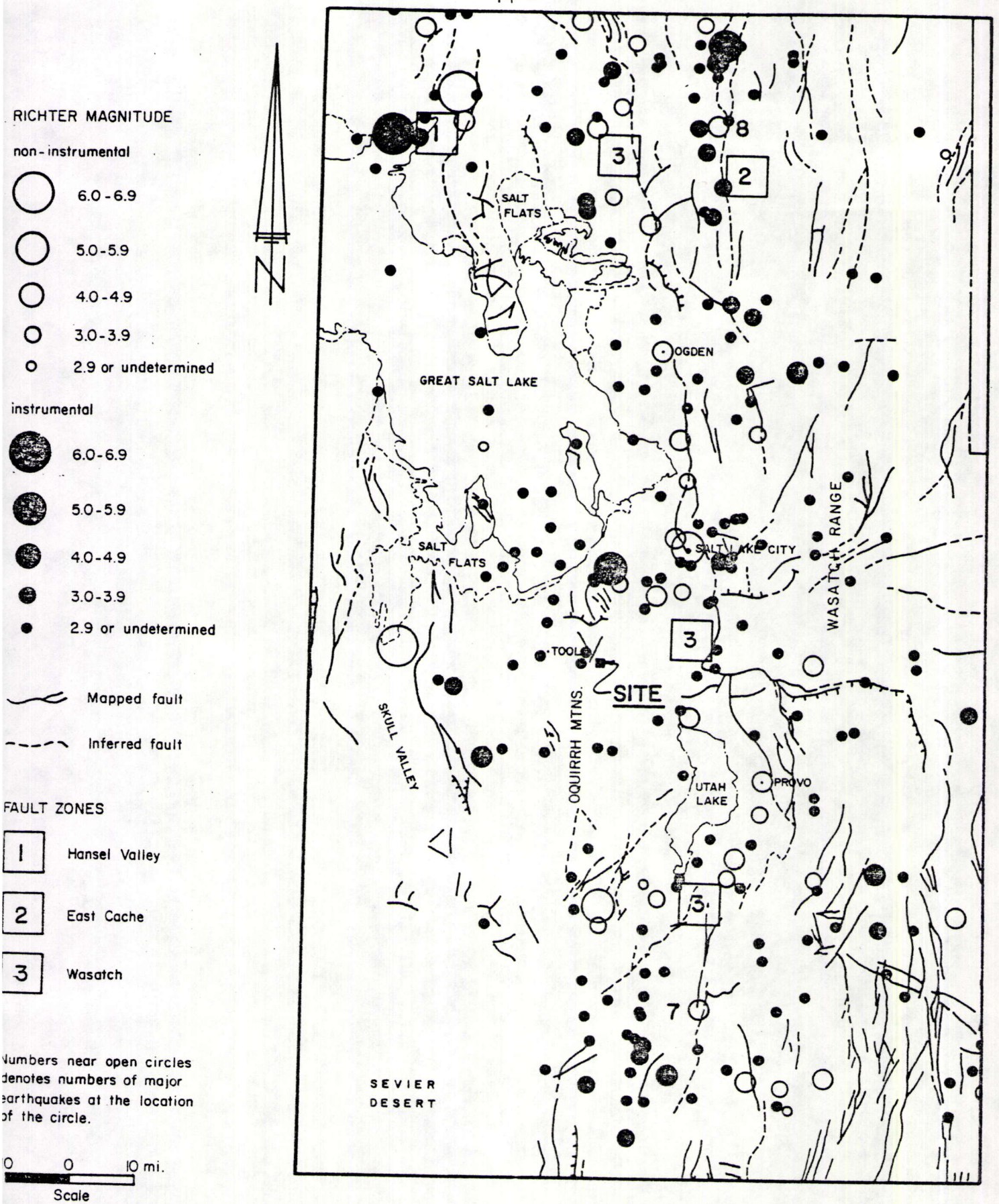


FIGURE 4 EARTHQUAKES ALONG THE WASATCH FRONT, UTAH.

TABLE 2-2

EARTHQUAKE RECURRENCE RATES AND POSSIBLE FAULT DISPLACEMENT

Magnitude	Number of Events Per Year or Number of Years (in Parentheses) Per Event
8	(300)
7	(76)
6	(21)
5	(5)
4	(2)
3	2
2	8
1	32
0	130
-1	520
-2	1,980

A site plan of the plant facility is shown is Figure 5. The building will house ion exchange, solvent extraction and calcining equipment, a storage area, a plant office and a laboratory. Other structures in the plant area include a fire pump, a sulfuric acid, an ammonia and a fuel oil storage tank and an electrical substation. Process and potable water will be provided by Kennecott and will be stored in an on-site tank.

3.2 Description of Plant Operation

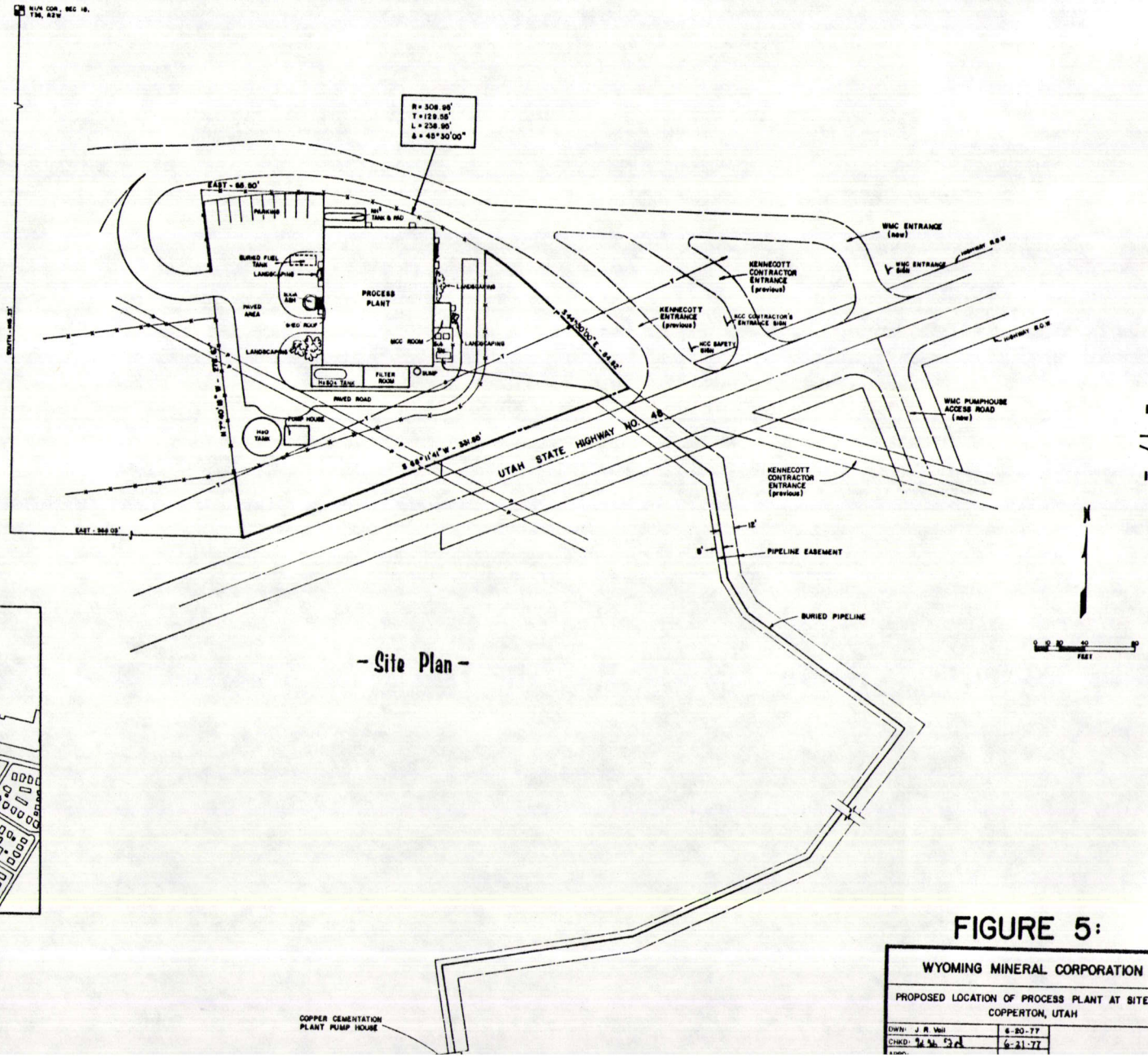
Naturally occurring autotrophic microorganisms (Thiobacillus thiooxidans and Ferrobacillus ferrooxidans) react with the percolating dump leach water and the insoluble copper and iron sulfides in the low-grade ore producing more soluble salts in the dump leach solution.[20] Uranium in the ore dumps undergoes a similar reaction.[21] This solution is collected and transferred to the copper cementation plant.

The flow rate of the pregnant copper dump leach solution, which also contains about 7.5 ppm of uranium, is about 45,000 gallons per minute.[3]

After the copper recovery operations have been completed by KCC, WMC will process about 6700 gallons per minute of the cementation plant's tails solution before it is again recycled to the KCC dump leach circuit.

Uranium recovery from the copper leach circuit tails will be effected by ion exchange techniques. The eluate from the ion exchange operations, which contains the uranium will be concentrated by solvent extraction techniques. The resultant strip solutions, with the uranium, will be reacted with ammonia to precipitate ammonium diuranate (ADU). The ADU product will then be washed, dewatered, calcined to U_3O_8 (yellowcake) and packaged for shipment to a conversion plant. About 430 pounds of yellowcake should be produced daily.

A process flow sheet is diagrammatically represented in Figure 6. The disposition of the copper cementation plant, dumps and the uranium recovery facility at the Bingham Canyon Mine property is illustrated in Figure 7.



- Site Plan -

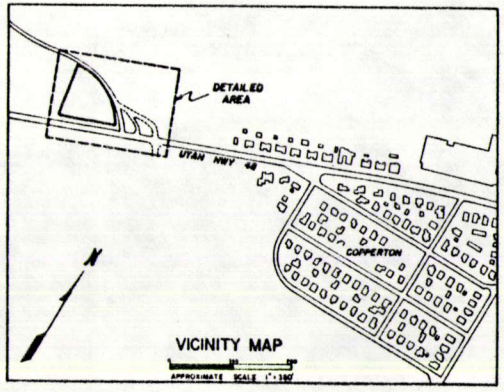


FIGURE 5:

WYOMING MINERAL CORPORATION		
PROPOSED LOCATION OF PROCESS PLANT AT SITE, COPPERTON, UTAH		
DWN: J.R. Vail	6-20-77	REV
CHKD: [illegible]	6-21-77	

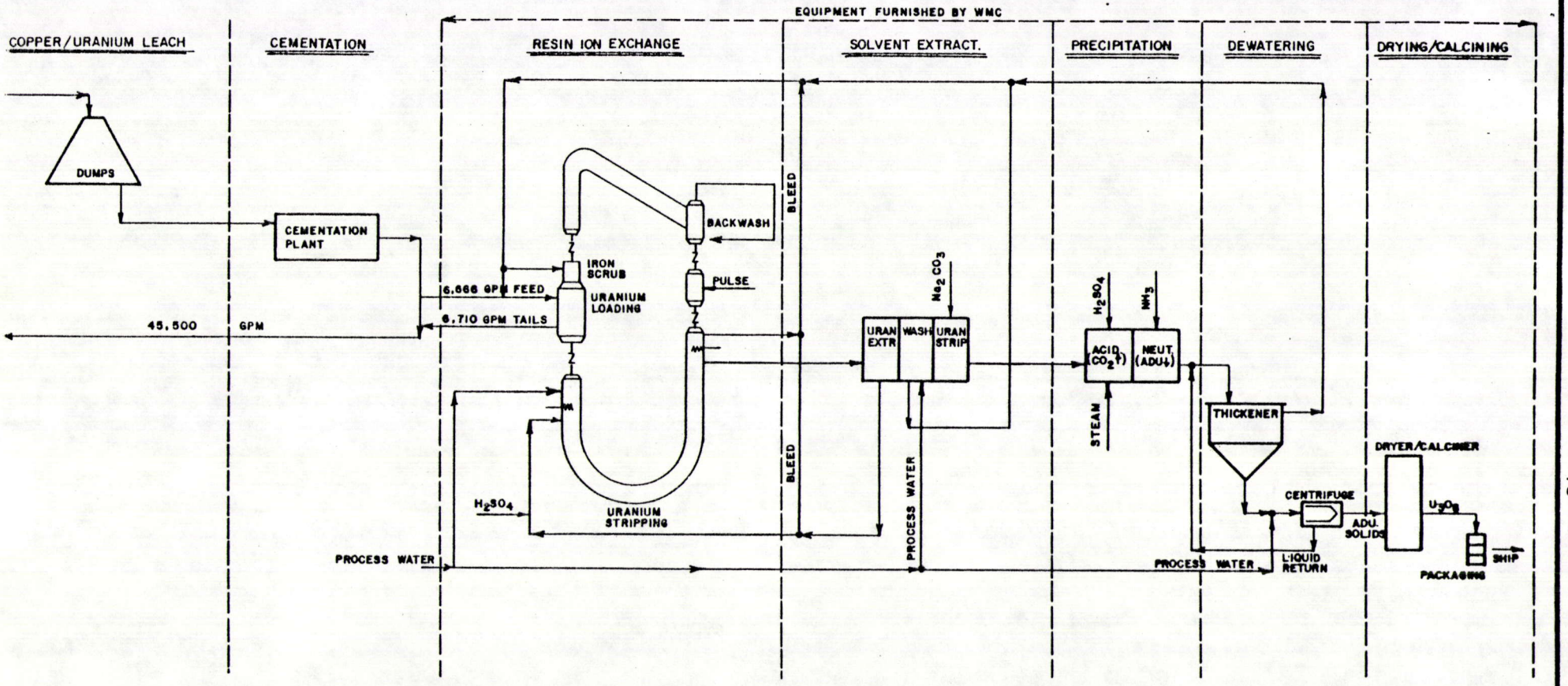


FIGURE 6 PROCESS FLOW SHEET (ESTIMATED FLOWS)

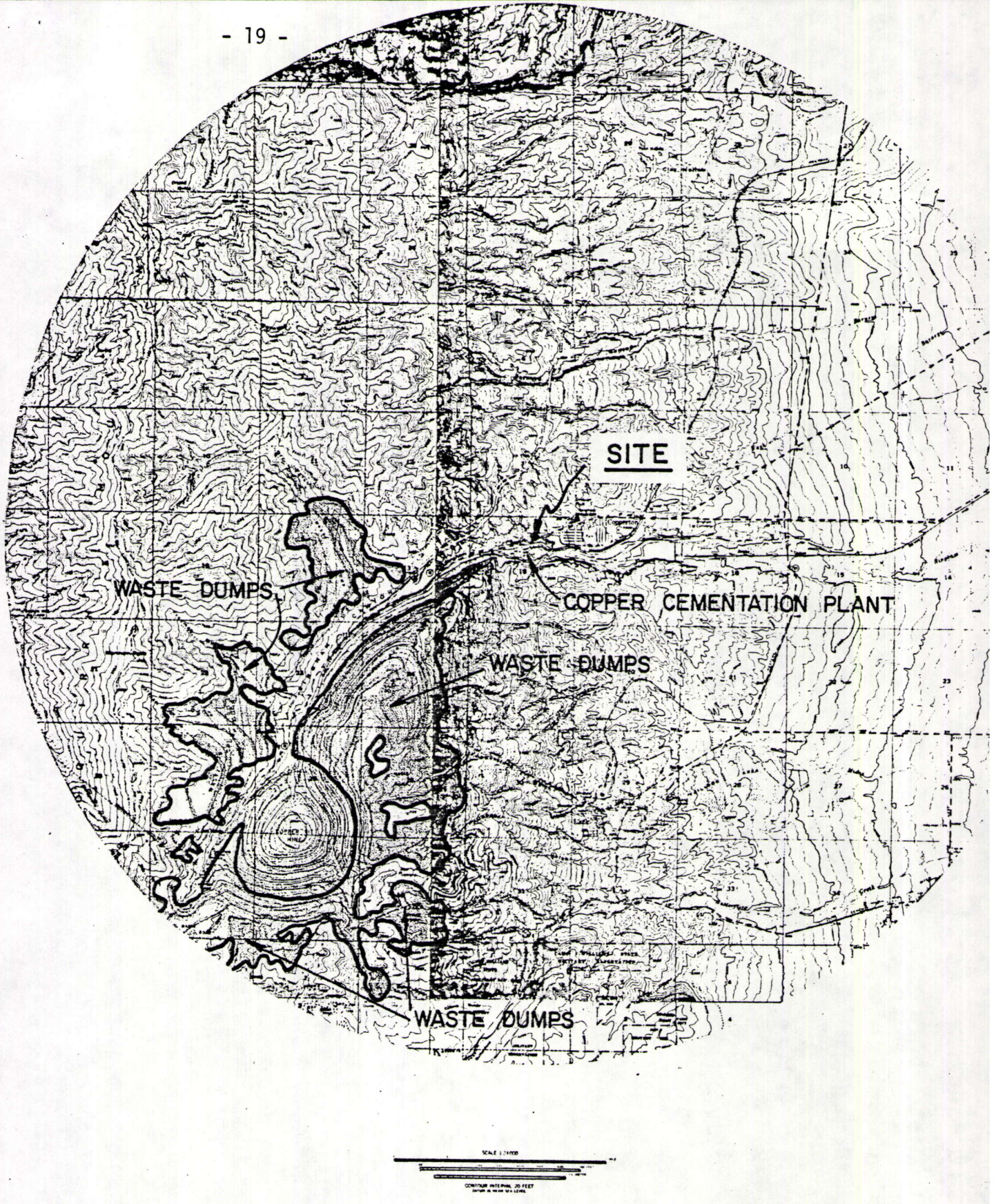


FIGURE 7
COPPER CEMENTATION PLANT & DUMPS

3.3 Plant Waste Sources

Effluents from the various unit operations in the uranium recovery plant occur in three physical forms: liquid, gaseous, and solid. The effluents may contain small quantities of natural uranium and nonradiological chemicals.

3.3.1 Liquid Effluents

The recovery plant will receive feed solution directly from the copper cementation plant. Immediately following the removal of uranium from this solution, it will be returned to the copper dump leach circuit. Plant bleeds originating from the ion exchange, solvent extraction and ADU dewatering unit operations (about 0.5 volume percent of the plant feed), may be added to the feed solution returns to the dump leach circuit. Miniscule quantities of extraneous ammonia, organic solvents and sodium salts would thereby by added to the dump leach solution. No apparent environmental impact can be anticipated from such actions.

3.3.2 Gaseous Effluents

Gaseous releases will originate primarily from the precipitation circuit, the solvent extraction circuit and the dryer/calciner unit operation.

Carbon dioxide will be released to the atmosphere from the decomposition of sodium carbonate prior to the precipitation of ADU. Volatilization of organic solvent materials from the solvent extraction circuit will be minimal because of their low vapor presssures. Water vapor, carbon dioxide and ammonia will be evolved during the calcining of the ADU. Yellowcake particulates may also be entrained with these atmospheric releases.

The plant will have a general fume collection system which will be used to hood the precipitation circuit, the thickener, the auxiliary hood at the yellowcake electrically heated calciner and loading station. The fume collection system will be vented to a Venturi dilute acid scrubber. In addition, the exhaust gases from the calcining/packaging equipment will also pass through a Venturi scrubber. Liquid bleed from the scrubber will be directed to the dump leach solution circuit. Anticipated minimal collection efficiency for the

scrubber systems is 99.8%.[22] Residual exhaust gases will exit the building through 10-inch diameter stacks that will be at least 10 feet above the roof and 25 feet from the nearest plant roof. The plant will also have a gravity vent in the roof top, a roof fan to circulate fresh air through the building and a hood exhaust in the laboratory. A flow diagram of the ventilation system is shown in Figure 8.

Air emissions permits have been issued by the Utah Department of Health to WMC for the calciner, general fumes collection system and the boiler. In addition, a particulate air emissions permit has been issued by U.S. EPA to WMC for the dryer/calciner unit operation.

3.3.3 Solid Wastes

Solid wastes which exhibit detectable contamination, e.g., rags, papers, packaging materials, worn out shop clothing and other miscellaneous materials generated in plant operations will be packaged appropriately for disposal at a licensed low-level burial site.

Non-radioactive solid waste will be disposed of by a commercial waste disposal firm.

3.3.4 Sanitary Wastes

Sewage from the plant will be handled by a septic tank designed in accordance with State of Utah regulations.

4. Environmental Impacts of Plant Construction

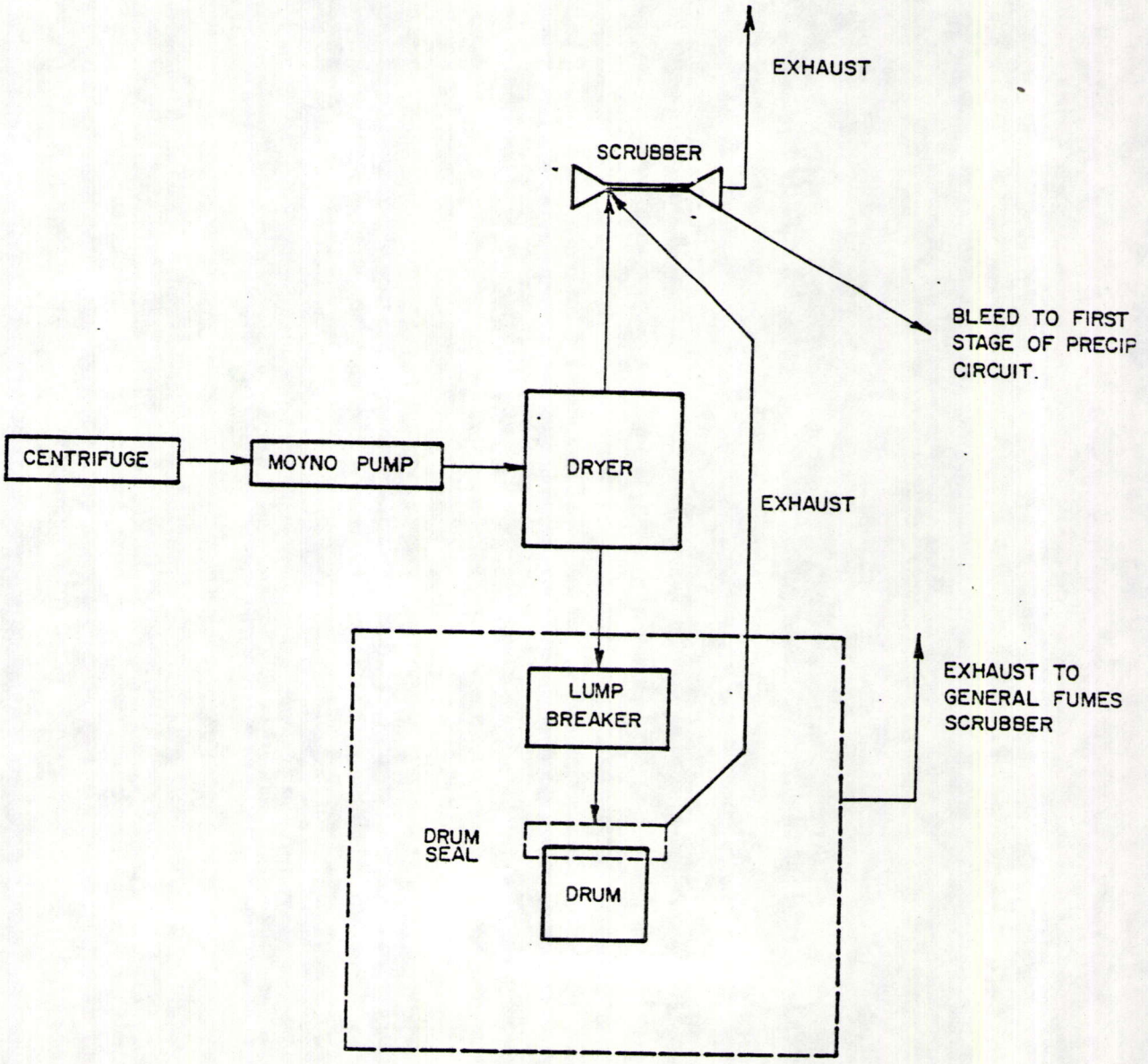
4.1 Site Preparation and Plant Construction

Construction activity effects would be very small and of a temporary nature, consisting primarily of dust, fumes, and noise effects. As the activities will be located within

FIGURE 8:

OPERATIONAL FLOW DIAGRAM

DRYER FACILITY AND ANCILLARY EQUIPMENT



or contiguous to the Bingham Canyon mine property, the incremental environmental impact due to these activities, in this heavy industrial zone, will be negligible.

5. Environmental Effects of Plant Operation

5.1 Radiological Impacts

5.1.1 Gaseous Effluents

The operation of the Copperton uranium recovery plant will result in the release of minute quantities of airborne radioactivity (natural uranium). Anticipated exhaust stack concentrations, furnished by the applicant, were used in staff calculations to estimate the atmospheric dispersion of the radionuclides in the environment. The X/Q values for ground release for radioactive atmospheric dispersion were derived from the applicant's wind-rose data and Regulatory Guide 1.3.[23] The annual average X/Q at the nearest residence (~900 ft. from the plant site) was estimated to be 2×10^{-5} sec/m^3.

Using the source term for annual release of 2435 μCi, (based on an anticipated daily release of 10gm U_3O_8) the concentration at the nearest residence was calculated to be 15.4×10^{-16} μCi/ml. This equates to 0.03% of the permissible concentration in 10 CFR Part 20 Appendix B, Table II.

For inhalation of insoluble compounds of uranium, the critical organ is the lung. Calculations were made to estimate the dose to the lung attributable to insoluble uranium caused by continuous inhalation at the nearest residence. Utilizing the conversion factors based on the ICRP Task Group Lung Model,[22,24] the 50-year dose commitment to an individual from continuous inhalation at the nearest residence is estimated to be 2 mrem. The annual average whole-body dose from natural radiation in the State of Utah is about 115 mrem/yr.[25] It is apparent that the individual dose due to the plant's operation is negligible compared to the natural background radiation.

5.1.2 Liquid Effluents

Due to the "closed loop" nature of the uranium recovery process, radiological release to the natural environment is not possible over existing conditions because all liquid releases flow into the copper leach circuit.

5.1.3 Solid Wastes

No significant radioactive solid wastes should be generated in the recovery operations. About 500 cubic feet of degraded ion exchange resin may be generated annually. If analyses indicate that its radioactivity content is below permissible limits for unrestricted disposal, it will be disposed of as nonradioactive waste. Otherwise, it will be packaged for disposal at a licensed burial site in accordance with U.S. Department of Transportation (DOT) and NRC regelations. The annual number of shipments for this activity will be insignificant.

5.2 Non-radiological Impacts

5.2.1 Gaseous Effluents

Primary non-radiological atmospheric releases from recovery operations would include carbon dioxide and ammonia fumes. Ammonia will be released from the neutralization step in the precipitation process and from the drying/calcining unit operations. The volatilized gas will pass through a hooded circuit and a wet scrubber which will absorb the bulk of the gas before it is exhausted from the building. The estimated ground level concentration of ammonia will be very low compared to the threshold limiting value for ammonia. No adverse effect to the population from such a release can be expected. The Utah Department of Health has issued an air emissions permit to the applicant for its operations and the U.S. Environmental Protection Agency has also issued a particulate air emissions permit to the company.

5.2.2 Liquid Effluents

Non-radiological liquid effluents from the uranium recovery plant, primarily dissolved salts present in the dump leach solution will have been incrementally increased by the recovery operation. These will flow back from the plant into the copper leach circuit. Since the feed solution is already saturated with the recovery plant's effluent constituents, the latter would precipitate in the mine dumps, be absorbed by the clays in the dumps, or serve as nutrients for the microorganisms in the dumps.

5.2.3 Solid Wastes

Solid wastes, such as trash or scrap materials would be collected and disposed of by a commercial waste disposal firm. No significant environmental impact is expected for this disposal.

6. Environmental Monitoring Program

6.1 Radiological Monitoring

Monitoring and control technology to maintain a safe operating environment will be consistent with practices in the uranium milling industry:

- Personnel will be monitored for external radiation exposures via passive thermoluminescent dosimetry (TLD). These will be collected quarterly, analyzed and the exposures recorded.

- Soil and vegetation in the plant's environs will be sampled annually and analyzed for gross alpha, thorium-230, radium-226, and natural uranium. The locations to be sampled include the site vicinity at the geology building, the Copperton City Park, and the prevailing wind direction at a point about 600 feet from the plant stack.

- Effluents from the calciner/scrubber stack will be directly monitored in accordance with the U.S. EPA permit and 40 CFR 52.2334. In addition, license conditions will specify the frequency of sample collection and analysis for uranium particulates at the calciner/scrubber stack and the stack for the fume collection system.

External radiation exposure of personnel will be monitored by area TLD dosimeters or by dosimeters worn by employees. Dosimeters will be evaluated quarterly.

6.2 Non-radiological Monitoring

No liquid chemical effluents will be discharged to the environment for the solutions from the uranium extraction plant will flow to the central pump station sump of KCC's precipitate plant and will be recycled back to the copper mine dumps.

The plant feed, in-plant streams and tails will be routinely sampled and analyzed for uranium, sodium, iron, ammonium, and sulfate contents for process control purposes.

6.3 Meteorological Monitoring

An onsite weather station will be used to record wind direction and velocity, precipitation, temperature, and relative humidity for a two year period to correlate the site's conditions with the permanent stations in the region. If measurements are in agreement, further use of the onsite station will be terminated.

In general, the applicant's overall monitoring program is summarized in Table 6-1.

7. Accidents; Safety Evaluation

The recovery of natural uranium from copper dump leach solutions involves chemical processing operations. The only significant radioactive material involved is the uranium itself which exhibits a low specific activity (0.67 μCi/gm). Thus, the environmental impact which could result from postulated accidents at this recovery plant and anywhere else on the plant site was analyzed primarily from the point of view of chemical effects, as for any other manufacturing plant in which chemicals are processed and where inventories of chemicals are stored. The radiological environmental impacts of postulated accidents would be insignificant at this facility.

A spectrum of possible accidents related to the operation of the recovery facility has been postulated and classified as follows:

Class 1 - Minor accidents with no release within the facility.

Class 2 - Accidents which could release some materials inside the plant, but with no release to the environs.

Wyoming Mineral Corporation, Copperton Site, Utah Monitoring Program

Sample Type	Frequency	Location	Analysis
Air	weekly	calciner/packaging stack.	gross alpha particulates
	monthly	general fume stack.	
Air	weekly	work stations in calcining/packaging area.	gross alpha particulates
	monthly	worker breathing zone sampling in calcining/ packaging area.	gross alpha particulates
	monthly	other process areas.	gross alpha particulates
	quarterly	selected process areas.	radon or radon daughters
Soil and Vegetation	quarterly	3 locations.	gross alpha 1/
Meteorological	continuous	onsite 2/	wind direcction, velocity; precipiration; temperature, relative humidity.

1/ If gross alpha measurements are significant, Th-230, Ra-226 and U_3O_8 analyses will be performed at the top of the hill, NNW of site; Copperton City Park; and within the site boundary fence in the prevailing wind direction.

2/ Onsite measurements may be discontinued after two years if measurements correlate with those of existing, permanent weather stations in the area.

Class 3 - Accidents which could release small amounts of materials outside the plant, but with no significant release offsite.

Class 4 - Accidents which could release materials

Class 5 - Radioactive materials release during a shipping accident.

Class 6 - Natural phenomena accidents

The staff concluded from their analyses of the above types of accidents that no significant environmental impact would result from such events. The prevalent defenses in depth at the site, in the forms of installed engineered safeguards, operational controls, required design reviews and required audits described in the applicant's operational report forestall the circumstance of such incidents.

7.1 Rupture of a Sump or Feed and Return Pipeline

This class 1 accident would result in solution spillage that would flow to Bingham Creek. From Bingham Creek, the solution would flow into the reservoir southeast of Copperton where it would join the copper leach circuit and be pumped to the top of the copper leach dumps. The feed and return solution pipeline system will have shut down valves to minimize the amount of solution lost should a rupture occur.

7.2 Fluid Leak in the Plant

This class 2 or class 3 accident assumes that a tank or similar equipment, leaks or ruptures. The equipment will be suitably curbed or diked to contain the solution such an event occur. Spilled solutions will be returned to the copper precipitation plant.

7.3 Fire in the Solvent Extraction Process

Prevention of this class 4 accident will be instituted by the prohibition of smoking or the use of open flames in the solvent extraction area, including the adjacent precipitation area. Warning signs will be posted in the area. When maintenance work will be required, cutting or spark-producing operations will be performed away from the area, if possible, and only under responsible supervision.

Should a fire occur, all mixers and pumps will be shut off to prevent the advance of the organic phase and the spread of the fire. A sprinkler fire extinguishing system will be activated concurrently. A diesel-driven fire pump, extinguishers and fire hoses are available on site for backup if required, until the county fire department responds to a call.

It is conceivable that some uranium bearing material could be entrained by the smoke in such an event. This would be dispersed over the same area as the carbon soot produced by the fire. Clean-up will be consistent with Regulatory requirements.

7.4 Transportation Accidents

Packaging of the uranium product and its transport from the plant site will comply with DOT and NRC regulations under 49 CFR Parts 170 through 179 and 10 CFR 71, respectively. Less than 15 truck trips per year will be required for the anticipated annual production. Such class 5 transportation accidents have been generically established to involve both low risk to the public's health and safety and insignificant radiation exposures to operational personnel. Natural uranium does not emit significant gamma radiation to produce an external radiation problem. All shipments will be made in exclusive-use trucks. Should a shipping package be breached in an accident, the environmental impact would be low since the materials are in solid, insoluble form and are not readily dispersed. Due to the low specific activity and low radiation levels of the uranium-bearing materials involved, the radiological environmental impact from hypothetical transportation accidents would not be significant.

7.5 Natural Phenomena Accidents

Class 6 accidents, such as an earthquake, will be mitigated by the design of the plant to withstand at least an earthquake of magnitude 6 on the modified Mercalli scale. The major consequence of such an event would be a fluid leak or fire which have been previously discussed.

7.6 Other Accidents

In order to reduce the impact that could result should a storage tank rupture, the fuel oil tank will be buried and designed to applicable fire codes. The sulfuric acid tank will be diked and the ammonia storage tank will be curbed.

8. Reclamation and Restoration

The plant is designed to produce approximately 143,000 pounds per year of U_3O_8 for a 20 year period. When operations are to be terminated and the useful life of the facility is nearing its end, decontamination and disposition (D and D) of the site facilities and the site area to as low as practicable levels will be undertaken. In all cases, the final radiation levels will be below the limits described as acceptable for future unrestricted use. The dismantling, decontamination and disposition plans will be conducted with a minimum of exposure to personnel in keeping with "as low as practicable" (ALAP) principles. WMC has a performance contract with KCC to ensure that the D and D will be done in an acceptable manner also.

Upon completion of the facility D and D, a radiological survey verifying that the facility has been decontaminated to levels as low as practicable will be submitted by the licensee before the Commission will act on terminating the license.

Within 6 months of the issuance of the license, WMC will provide the NRC with a decontamination plan for the facility, including cost estimates and financial arrangements to assure availability of the required funding for the D and D actions.

9. Basis for the Conclusion of a Negative Declaration

The environmental impact and effects due to the operation of a uranium recovery facility by Wyoming Mineral Corporation under the proposed licensing action as analyzed by the staff are summarized as follows:

1. The population density and land use characteristics of the site environs do not preclude the acceptability of the licensing action.

2. The operation of the facility will not affect the water resources and will have no significant environmental impact on aquatic environments.

3. Potential radioactive material discharges to the environs from the plant's operations have been estimated to be well below applicable limits. Adequate instrumentation to monitor and record emission data will be installed at the facility.

4. The possible accidents involving the facility are extremely remote and would have a negligible impact on the environment and the public's health and safety.

5. Shipments of radioactive materials from the facility will have an insignificant impact on the environment and the health and safety of the public.

6. Public notification of the proposed licensing action by prominent advertisements in newspapers of general circulation in the region have resulted in no adverse reactions.

In connection with the issuance of a license to Wyoming Mineral Corporation, the staff concludes that an environmental impact statement is not required under NRC regulations in 10 CFR 51.5(b), nor CEQ guidelines in 40 CFR 1500.6. As shown in this appraisal, the environmental effects of a uranium recovery plant operation utilizing copper mine dump leach solution is insignificant. As provided in 10 CFR 51.5c(1), a negative declaration has been prepared in accordance with the requirement of 10 CFR 51.7.

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2. "Kennecott, Its Men and Minerals," Public Relations Department, Kennecott Copper Corporation, 161 East 42nd Street, New York, N.Y. 10017

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APPENDIX A

Environmental Approvals and Permits from Local, State, and Federal Agencies Relating to this Licensing Action.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER, COLORADO 80203

JUN 3 1977

REF: 8AH-A

Mr. W. H. Ford
Wyoming Mineral Corporation
3900 S. Wadsworth Blvd.
Lakewood, Colorado 80235

Dear Mr. Ford:

Please be advised that pursuant to 40 CFR Sections 52.2334 and 51.18, the Environmental Protection Agency (EPA) hereby grants approval to Wyoming Mineral Corporation to construct a uranium recovery plant at Copperton, Utah. This approval does not relieve Wyoming Mineral of the responsibility to comply with the testing and reporting requirements of 40 CFR Section 52.2334 and all other local, State, and Federal regulations.

Sincerely yours,

John A. Green
Regional Administrator

cc: Mr. Alvin Rickers
Bureau of Air Quality
Salt Lake City, Utah

STATE OF UTAH—DEPARTMENT OF SOCIAL SERVICES

SCOTT M. MATHESON
Governor
ANTHONY W. MITCHELL, Ph.D.
Executive Director

DIVISION OF HEALTH
44 MEDICAL DRIVE
SALT LAKE CITY, UTAH 84113
AREA CODE 801
533-6108

LYMAN J. OLSEN, M.D., M.P.H.
Director of Health

March 22, 1977

Mr. W. A. Eisenbarth
Manager of Licensing and Safety
Wyoming Mineral Corporation
3900 South Wadsworth Boulevard
Lakewood, Colorado 80235

Dear Mr. Eisenbarth:

On February 20, 1977 intent to approve your proposal to construct a uranium recovery plant at Bingham, Utah was published in the Salt Lake Tribune.

The thirty-day comment period has elapsed and no response was received. Approval to proceed with construction/installation is hereby granted. It is stipulated that equipment conform with plans and specifications submitted.

Reapplication for permit to construct a uranium oxide dryer at the same location was submitted by Mr. Ford of your office in a letter dated March 2, 1977. Plans and specifications for the air cleaning equipment have been evaluated. It is the intent of the Executive Secretary, Utah Air Conservation Committee, to approve your proposal. Notice of intent to approve will be published in the Legal Section of the Salt Lake Tribune on March 27, 1977. As you are aware, a thirty-day comment period is allowed to accomodate public response, if any.

Approval or disapproval to construct will be issued after the period has expired.

Sincerely,

Alvin E. Rickers

Alvin E. Rickers
Executive Secretary
Utah Air Conservation Committee

RLR:csc

cc: Salt Lake City-County Health Department

STATE OF UTAH—DEPARTMENT OF SOCIAL SERVICES

SCOTT M. MATHESON
Governor
ANTHONY W. MITCHELL, Ph.D.
Executive Director

DIVISION OF HEALTH
44 MEDICAL DRIVE
SALT LAKE CITY, UTAH 84113
AREA CODE 801
533-6108

LYMAN J. OLSEN, M.D., M.P.H.
Director of Health

Board of Health
Air Conservation Committee
Health Facilities Council
Medical Examiner Committee
Nursing Home Advisory Counc
Water Pollution Committee

Enviromental Health Services Branc
72 East 4th South
Salt Lake City, Utah

May 4, 1977

Mr. W. A. Eisenbarth
Manager of Licensing and Safety
Wyoming Mineral Corporation
3900 South Wadsworth Blvd.
Lakewood, Colorado 80235

Dear Mr. Eisenbarth:

On March 27, 1977, the Executive Secretary, Utah Air Conservation Committee, published his intent to approve your proposal to add a uranium oxide dryer to your company's uranium recovery plant at Bingham Canyon, Utah. The necessary thirty-day comment period has expired and no comments have been received.

Approval to proceed with construction/installation is hereby granted. Please advise us when the facility is completed and operable so a compliance inspection can be made.

Sincerely,

Alvin E. Rickers

Alvin E. Rickers
Executive Secretary
Utah Air Conservation Committee

RLR:il

cc: Salt Lake City-County Health Dept.

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING
1588 West North Temple
Salt Lake City, Utah 84116
(801) 533-5771

DECLARATION OF EXEMPTION
****

As Provided for in Section 40-8-4 UCA 1953, I hereby declare an exemption from the "Mined Land Reclamation Act", in that less than 500 tons of material is being mined or less than two (2) acres of land is being excavated or used as a disposal site during a period of twelve (12) consecutive months, from the following designated claims.

NAME OF CLAIM	LOCATION				
	Quarter sec. (NW,SW,NE,SE)	Sec.	Twp.	Range	County
Uranium/Copper Project	NE¼	18	3S	R2W	Salt Lake
Copperton Site					

1/3/77
DATE

W A Eisenbarth
SIGNATURE

Name W. A. Eisenbarth, Manager Licensing and Safey

Address 3900 South Wadsworth, Lakewood, CO 80235

*This form needs to be filed one time only.

**If in the event that material moved or acreage disturbed exceeds 500 tons or two (2) acres respectively within any twelve (12) month period, a notice of intention to conduct mining must be filed.

R-226 (Rev. 7/73)
HIGHWAY RIGHT-OF-WAY
ENCROACHMENT

PERMIT

- 39 -

30625

District No. Two Date February 2, 1977 Application of Wyoming Mineral Corporation, By W. A. Eisenbarth, Title Manager, Licensing & Gen. Address 3900 So. Wadsworth Blvd, Lakewood, Phone 303-986-6530, in _____ County is hereby granted, subject to the Regulations for the Control and Protection of State Highway Rights-of-Way, Standard Specifications for Road and Bridge Construction, Specifications for Excavation on State Highways, General Safety Orders of the Industrial Commission, Safety Manual for Road and Bridge Construction, Instructions to Flagmen, the approved plans, and any special limitations set forth herein, permission for the purpose of installing three access openings in accordance with the plot plan approved by this office.

within right-of-way limits of Highway No. 48, State Maintenance Section No. 31, Milepost No. _____, in the following location:
9090 West Bingham Highway

Receipt of $5.00 permit fee is hereby acknowledged (delete where not applicable). The work permitted herewith shall commence February 5, 1977 and shall diligently be prosecuted to completion. The work shall be completed and all disturbed surfaces or objects restored on or before 60 days, 19____. In the event work is commenced under this permit, the applicant agrees to prosecute the same to completion by the date herein above specified. In the event the applicant fails or refuses to complete the work the State Highway Department may, at its election, fill in or otherwise correct any existing impediments at the expense of and subject to immediate payment by the applicant.

Applicant shall execute a bond in the minimum amount of $1000, increased by multiples thereof as determined by the District Engineer, to insure faithful performance of the permittee's obligation. The bond shall remain in force for three years after completion of the work.

Before work permitted herewith is commenced, the applicant shall notify: A. J. Sopko 533-6183 and commencement of said work is understood to indicate that the applicant will comply with all instructions and regulations of the Utah State Department of Highways with respect to performance of said work, and that he will properly safeguard said work to prevent accident and shall indemnify and hold harmless the Utah State Department of Highways from all damages arising out of any and all operations performed under this Permit.

Permittee shall not perform any work on State highway right-of-way beyond those areas or operations stipulated on the permit.

If applicant fails to comply with State Highway Department regulations, specifications, or instructions pertinent to this permit, the District Engineer or his duly authorized representative may by verbal order suspend the work until the violation is corrected. If the applicant fails or refuses to comply promptly, the District Engineer or his authorized representative may issue a written order stopping all or any part of the work. When satisfactory corrective action is taken, an order permitting resumption of work may be issued.

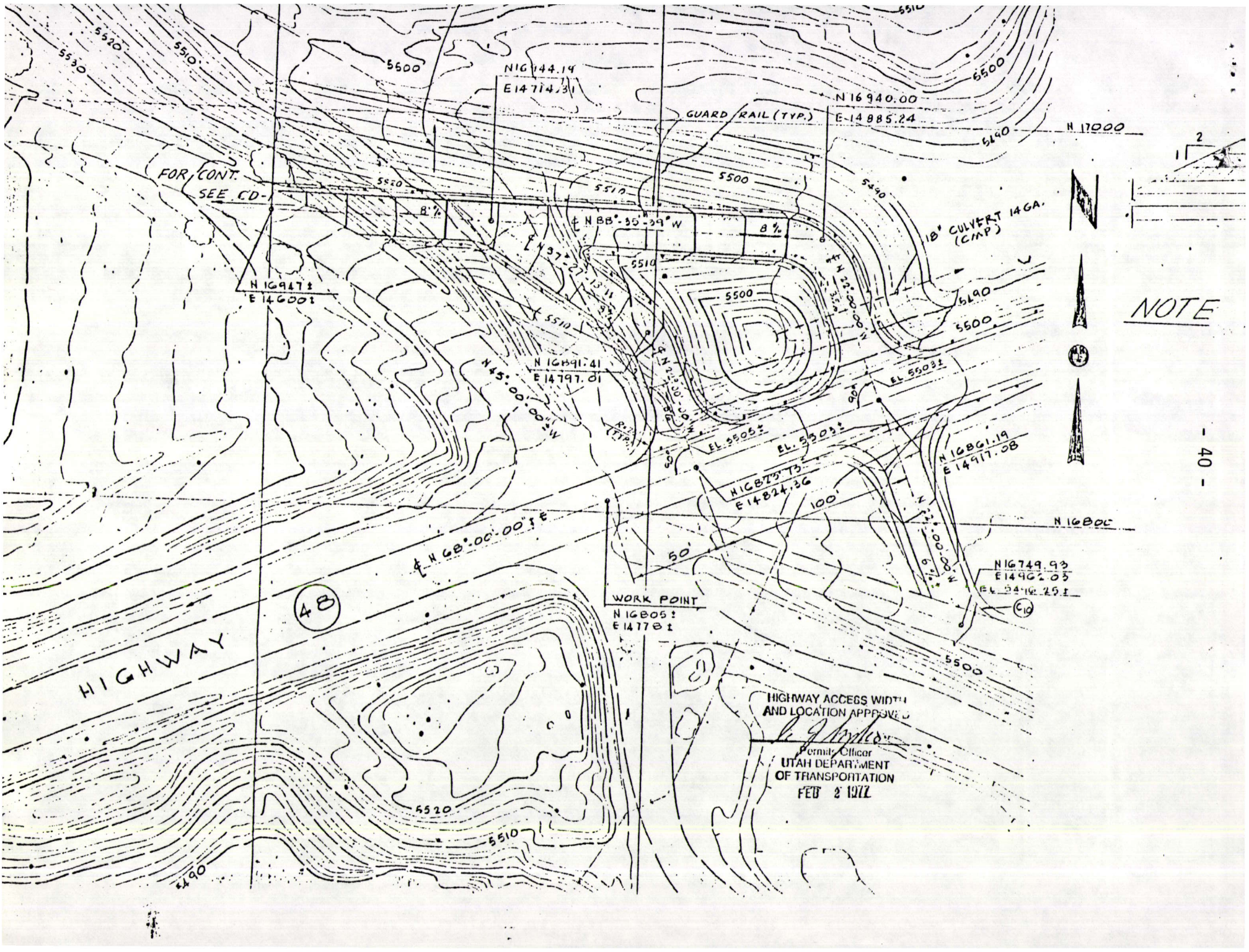
Special Limitations: APPLICANT RESPONSIBLE FOR REPAIRING AND/OR RESTORING ANY DAMAGED PORTION OF THE ROADWAY.

Mailed

(Signature of Applicant)

APPLICANT COPY

Approved by: _____ For District Engineer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